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AND RESCUE
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Agenda item 6

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SATELLITE SERVICES (COSPAS-SARSAT)

Status of the COSPAS-SARSAT Programme

Note by COSPAS-SARSAT

SUMMARY

<i>Executive summary:</i>	This document highlights recent developments in the COSPAS-SARSAT Programme and provides a brief status report on the System.
<i>Action to be taken:</i>	See paragraph 19
<i>Related documents:</i>	None

Introduction

1 The COSPAS-SARSAT System provided distress alerts which assisted SAR services in 389 SAR events which resulted in the rescue of 1,312 persons during 1997. Of this total number of SAR events, 257 were maritime incidents, of which 2/3 involved the use of 406 MHz distress beacons and 1/3 involved the use 121.5 MHz distress beacons. Reports of the SAR events assisted by COSPAS-SARSAT during 1998 are currently being analysed and the corresponding statistics will be provided when available.

2 During 1998 the COSPAS-SARSAT System continued to expand with the launch of two new satellites and the decommissioning of one of the older models, and the transition of three Mission Control Centres (MCCs) from initial to full operational capability status. COSPAS-SARSAT Participants continued to upgrade their ground segment equipment to accommodate the processing of new 406 MHz beacons which can transmit encoded position data. A number of actions were also undertaken to ensure the ground segment compatibility in respect of year 2000 requirements.

3 The COSPAS-SARSAT Council, at its 21st session in October 1998, considered the final report on the demonstration and evaluation of the 406 MHz geostationary search and rescue (GEOSAR) system and decided that the GEOSAR satellite system components should be adopted as an enhancement to the low Earth orbit search and rescue (LEOSAR) satellite system.

4 A summary of the status of the COSPAS-SARSAT System is provided below. Additional information is available in the latest issue of the document "COSPAS-SARSAT System Data", or may be obtained from the COSPAS-SARSAT web site at www.cospas-sarsat.org/cospas-sarsat.

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Table 1: COSPAS-SARSAT LEOSAR Space Segment Status (May 1999)

COSPAS-SARSAT Payload	406 MHz SARP		406 MHz SARR	12i.5 MHz SARR	243 MHz SARR
	Global Mode	Local Mode			
Cospas-4 ⁽¹⁾	O	O	NA	O	NA
Cospas-6 ⁽²⁾	O	O	NA	O	NA
Cospas-8	O	O	NA	O	NA
Sarsat-3	N	N	O	O	O
Sarsat-4	O	O	N	O ⁽³⁾	O
Sarsat-6	N	N	O	O	O
Sarsat-7	O	O	O	O	O

Notes: O - Operational. (1) - Limited operation in Southern hemisphere.
 NA - Not applicable. (2) - Reduced 406 MHz message throughput.
 N - Not operational. (3) - Some Electromagnetic Interference (EMI) degradation.
 SARP - SAR processor.
 SARR - SAR repeater.

Table 2: COSPAS-SARSAT Ground Segment Status (May 1999)

Participant	LEOLUT Name	MCC Status	Participant	LEOLUT Name	MCC Status
Algeria	Ouargla	O	Japan	Yokohama	O
Australia	Albany Bundaberg	O	Korea (Rep.of)	Taejon	O
Brazil	Brasilia Recife	O	New Zealand	Wellington	⁽¹⁾
Canada	Churchill Edmonton Goose Bay	O	Norway	Tromsø	O
Chile	Santiago Punta Arenas	O	Pakistan	Lahore	N
China	Beijing	O	Peru	Callao	O
France	Toulouse	O	Russia	Arkhangelsk Moscow Nakhodka Novosibirsk	O
Hong Kong, China	Hong Kong	O	Singapore	Singapore	O
India	Bangalore Lucknow	O	Spain	Maspalomas	O
Indonesia	Ambon (N) Jakarta	O	UK	West Freugh	O
Italy	Bari (N)	IOC	USA	Alaska California Guam Hawaii Puerto Rico Texas	O
ITDC	Keelung	O			

Notes: O - Operational UT - Under Test
 IOC - Initial Operational Capability N - Non Operational
 (1) - The NZ LUT is directly connected to the Australian MCC (AUMCC)

LEOSAR Satellite System Status

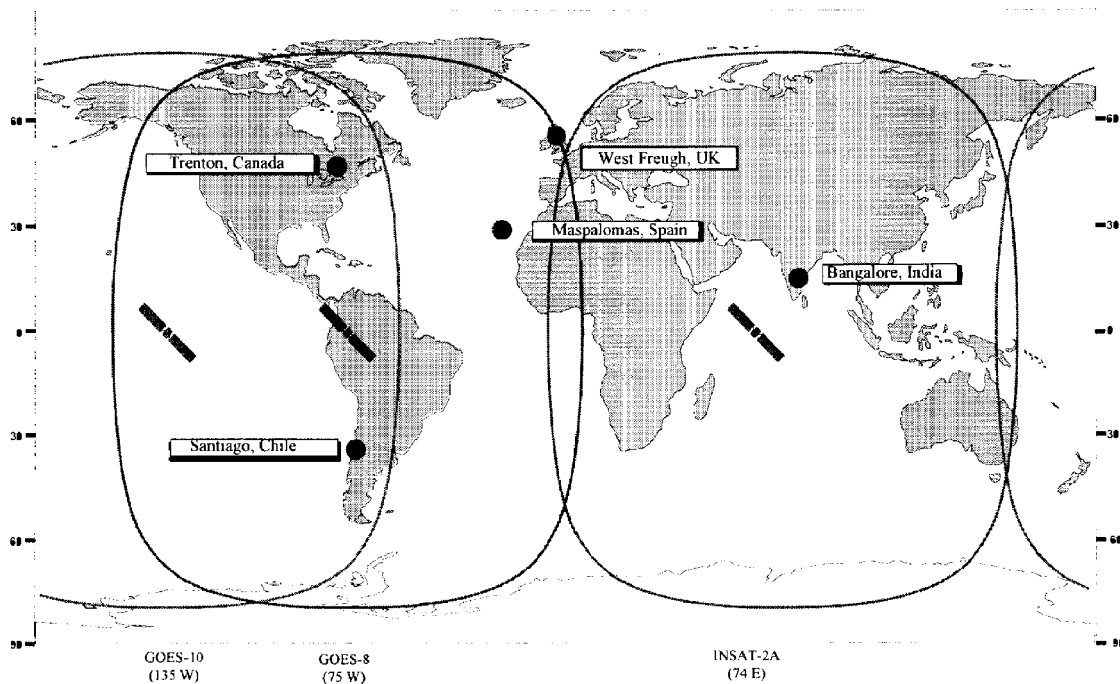
5 In May 1999, the COSPAS-SARSAT low Earth orbit (LEOSAR) space segment included seven satellites (see detailed status at Table 1). During 1998, two satellites were launched, Sarsat-7 in May 1998 and Cospas-8 in December 1998. The Sarsat-7 payload includes a second generation 406 MHz processor (SARP-2) which provides improved performance in respect of capacity and protection from interference, and an expanded receiver bandwidth to allow for future growth of the 406 MHz beacon population.

6 Thirty-six ground receiving stations, more commonly known as LEOLUTs (LEOSAR Local User Terminals), are in operation in twenty countries. Twenty-one MCCs (Mission Control Centres) are responsible for the world-wide distribution of COSPAS-SARSAT alert data to SAR services. The status of the COSPAS-SARSAT LEOSAR ground segment is shown in Table 2.

406 MHz Geostationary Search and Rescue (GEOSAR) Satellite System

7 COSPAS-SARSAT has completed the demonstration and evaluation (D&E) of 406 MHz GEOSAR systems. Based upon the positive results achieved, the COSPAS-SARSAT Council concluded that the COSPAS-SARSAT System would be enhanced by integrating GEOSAR system components, and decided that the integration of GEOSAR components should be implemented as soon as possible.

Figure 1: Footprint of the Geostationary Satellites (May 1999)



8 On 5 February 1999, the USA notified the International Civil Aviation Organization (ICAO), as Depositary of the International COSPAS-SARSAT Programme Agreement, of a change in the United States contribution to the COSPAS-SARSAT Space Segment, and declared the addition of the 406 MHz capability on the Geostationary Operational Environmental Satellites (GOES-East and GOESWest) as an enhancement to the existing COSPAS-SARSAT (LEOSAR) Space Segment.

9 The current GEOSAR space segment availability and projected satellite constellation is provided at Table 3 and the coverage footprint associated with the satellites currently being tracked by GEOLUTs is provided at Figure 1. The GEOSAR ground segment status is provided at Table 4. Although at this time the experimental GEOLUTs used for collecting data for the GEOSAR D&E have not been formally commissioned in accordance with the approved specification, they continue to be operated and the distress alerts are processed for distribution within the COSPAS-SARSAT System.

Table 3: COSPAS-SARSAT GEOSAR Space Segment (May 1999)

Spacecraft	Launch Date	Position	Status
GOES-8 (GOES-East)	April 1994	75° W	In operation
GOES-10 (GOES-West)	April 1997	135° W	In operation
INSAT-2A	1992	74° E	In operation
GOES-9	May 1995	105° W	Standby
INSAT-2B	1993	93.5° E	Standby
Luch-M2	1999	95° E	Projected
Electro-2	2000	76° E	Projected
MSG	2000	0°	Projected
INSAT-3	2000	To be determined	Projected

Table 4: COSPAS-SARSAT GEOSAR Ground Segment Status (May 1999)

Geostationary Satellite	GEOLUTs Associated to Geostationary Satellites				
	Trenton, Canada	Santiago, Chile	Bangalore, India	Maspalomas, Spain	West Freugh, United Kingdom
GOES-8 (East)	q	q		q	q
GOES-10 (West)	q				
INSAT-2A			q		

406 MHz Beacons

10 A survey of beacon manufacturers indicated that over 32,000 new beacons operating on 406 MHz had been produced and distributed during 1998. Assuming that a number of these are still in stock and that some older beacons have been replaced, it is estimated that the number of 406 MHz beacons in service at the end of 1998 was about 185,000 (an increase of 19% from 1997). Most of these beacons were maritime EPIRBs. However, a number of airlines have initiated the equipping of their fleets with 406 MHz Emergency Locator Transmitters (ELTs). In 1998, about 9% of the total 406 MHz beacon production were ELTs and 4% were Personal Locator Beacons (PLBs). The number of 406 MHz ELTs is expected to grow in coming years.

406 MHz Beacon Specifications

11 An analysis of the GEOSAR system capacity conducted in 1998 revealed that a new 406 MHz beacon channel would be required to handle the anticipated growth in 406 MHz beacon message traffic. In view of this, the COSPAS-SARSAT beacon specification (document C/S T.001) was amended to include a new frequency channel at 406.028 MHz. Use of the new channel will be optional for new beacon models approved from 2000 and will be mandatory for beacon models approved from 2002. Additional changes have been incorporated into the COSPAS-SARSAT beacon specification, including the recommendation that the beacon 15 hexadecimal identification be permanently marked on the exterior of the beacon to assist in the control of the beacon coding.

12 The IMO resolution which specifies the performance standards for 406MHz EPIRBs (IMO Assembly resolution A.810(19)) identifies ITU Recommendation ITU-R M.633 as the technical specification for the beacon transmit signal and message format. In view of the modifications to the COSPAS-SARSAT beacon specification identified above and changes to the beacon message formats which have been previously reported to IMO (i.e. location protocol beacons allowing for the encoding of position data), COSPAS-SARSAT proposed changes to ITU-R M.633 to make the ITU Recommendation consistent with the COSPAS-SARSAT beacon specification (document C/S T.001). The proposed changes will be considered by the ITU Study Group 8 at its meeting scheduled for 11-12 November 1999.

406 MHz Non-Distress Alerts and Beacon Malfunctions

13 The level of non-distress activations of 406 MHz beacons continues to be a matter of concern to COSPAS-SARSAT, consequently, COSPAS-SARSAT convened a task group meeting during January 1999 to investigate this issue. The task group analysed the causes of non-distress beacon activations, proposed actions to minimise their occurrence, and identified the lead organisation responsible for implementing these actions. Additionally, enhancements to COSPAS-SARSAT monitoring and reporting requirements were proposed to provide information on the causes of actual non-distress beacon activations. The findings of the task group will be reviewed at the 13th meeting of the COSPAS-SARSAT Joint Committee to be held in June 1999, and the resulting recommendations will be submitted to the COSPAS-SARSAT Council for consideration at the CSC-23 Session in October 1999.

Phasing-Out of 121.5/243 MHz Satellite Processing

14 COSPAS-SARSAT noted the view expressed by COMSAR 3 and endorsed by MSC 70, that the "satellite processing of 121.5 MHz distress alerts should be phased-out, and that a plan for such phasing-out should be developed by COSPAS-SARSAT". COSPAS-SARSAT also noted:

- .1 the ICAO Council's decision to amend the relevant Annexes to the ICAO Convention and require that new aircraft from 2002, and all aircraft from 2005, be equipped with ELTs operating on 406 MHz and 121.5 MHz; and
- .2 the view of the ICAO Council that 121.5 MHz satellite services could be discontinued from 2008.

15 At its CSC-21 Session in October 1998, the COSPAS-SARSAT Council decided to convene in March 1999 a task group to identify the practical aspects of phasing-out the satellite processing of 121.5 MHz emissions, should the decision be made by COSPAS-SARSAT to terminate this service. The task group conducted a detailed analysis of the relevant issues, developed an extensive list of actions to be undertaken prior to phasing-out COSPAS-SARSAT 121.5 MHz satellite services, and proposed recommendations that should be implemented by COSPAS-SARSAT Participants and Administrations to prepare for a transition to 406 MHz beacons or other means of alerting. The findings of the Task Group

will be reviewed at the 13th meeting of the COSPAS-SARSAT Joint Committee and the resulting recommendations will be submitted to the COSPAS-SARSAT Council for consideration at the CSC-23 Session in October 1999.

Year 2000 (Y2K) Compliance

16 COSPAS-SARSAT has implemented a comprehensive programme to address Y2K issues. The current and future COSPAS-SARSAT satellite constellations (both low Earth orbit and geostationary segments) are now believed to be year 2000 compliant. Furthermore, the Administrations which provide the ground segment components of the System have implemented, or will implement, national programmes to achieve year 2000 compliance of the system components for which they are responsible. The COSPAS-SARSAT Council has emphasised to responsible Administrations the importance of ensuring that nationally approved 406 MHz beacons are year 2000 compliant. At the request of the Council, all manufacturers of COSPAS-SARSAT type approved 406 MHz beacons have been contacted by the Secretariat; none have identified Y2K compliance problems.

COSPAS-SARSAT 2000 Seminar

17 The COSPAS-SARSAT Council has decided to hold a three day seminar in year 2000 in Montreal, Canada, in conjunction with the annual SARSCENE event organised by the Canadian National Search and Rescue Secretariat (NSS). The COSPAS-SARSAT 2000 Seminar will be held from 12 to 14 October 2000. The Seminar programme has not been finalised at this stage, however, the following topics should be addressed during that event:

- the role of COSPAS-SARSAT and the international co-operation on search and rescue;
- highlights of COSPAS-SARSAT effectiveness in support of SAR services;
- 121.5 MHz system phase-out: the views of international organizations, COSPAS-SARSAT Participants, SAR services and Administrations;
- 406 MHz system operations and recent developments (LEOSAR/GEOSAR combined operations; new 406 MHz EPIRBs, ELTs and PLBs; reducing the number and impact of 406 MHz false alerts; the challenge of world-wide alert data distribution).

New Arrangements for the COSPAS-SARSAT Secretariat

18 The COSPAS-SARSAT Secretariat was established by Inmarsat in 1987 to assist COSPAS-SARSAT participating countries in co-ordinating the development and operation of the COSPAS-SARSAT System. After the privatization of Inmarsat on 15 April 1999, the COSPAS-SARSAT Secretariat is continuing as part of the International Mobile Satellite Organization (IMSO). The COSPAS-SARSAT Secretariat will continue to report to, and take direction from the COSPAS-SARSAT Council.

Action requested of the Sub-Committee

19 The Sub-Committee is invited to note the information provided.
